

## ***Lobataria newtoni* gen. et sp. nov., (Hydrozoa, Anthoathecata, Tubulariidae) from southern Australia**

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### **Abstract**

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*Lobataria newtoni* gen. et sp. nov. differs from other members of the family Tubulariidae in possessing a hydrocaulus lacking internal canals, ridges or partitions. The hydroid is solitary, and attaches to old bivalve shells on sandy seabeds in sheltered shallow water habitats.

### **Keywords**

*Lobataria newtoni* gen. et sp. nov., solitary tubularian hydroid, sheltered oceanic habitat, southern Australia.

### **Introduction**

The hydroid described in this paper was found in shallow water by the author and colleagues at Blairgowrie and Rye on the eastern coast of Port Phillip, Victoria (southeastern coast of mainland Australia) in November 2007 and April, 2008. More specimens were observed in the same localities in July 2008 and also at Pt Richards on the western side of Port Phillip.

Six species of hydroids of the family Tubulariidae (Allman, 1864) have been recorded from temperate southern Australia: *Tubularia larynx* Ellis and Solander, 1786 [= *Ectopleura larynx* (Ellis and Solander, 1786)]; *Ectopleura crocea* (Agassiz, 1862), *Tubularia ralphii* Bale, 1884; *Zyzyzus spongiculus* (von Lendenfeld 1884); *Tubularia exxonia* Watson, 1978; *Ralpharia magnifica* Watson, 1980; *Ralpharia coccinea* Watson, 1984 and *Hybocodon cryptus* Watson, 1984.

*Tubularia larynx* was reported from Port Phillip by Ralph (1966) and Watson (1973) from Pearson Is.- in the Great Australian Bight. Re-examination of this material proved the species not to be *T. larynx* but a new hydroid, *Ralpharia magnifica* (Watson, 1980). While there is still some doubt about the relationship of *Tubularia ralphii* with *Ectopleura crocea*, it is likely that both are the same species (Watson 1999).

Distinction of genera in the family Tubulariidae is based upon the following characters:

- absence or presence and disposition of ectodermal ridges and canals in the hydrocaulus,
- whether the hydrocaulus widens or not distally above the base,
- the number of whorls of oral tentacles,

- presence or absence of branching of the blastostyle,
- reproduction by either medusa or actinula larva.

The order of importance accorded these characters varies among authors – Wedler and Larson (1986), Calder (1988), Petersen (1990), Migotto (1996), Bouillon (1999), Bouillon and Barnett (1999), Bouillon and Boero (2000), Schuchert (1996, 2001) and Bouillon et al. (2006).

The present material accords with the generally accepted concepts of these authors conforming most closely with the concept of *Tubularia* by Petersen (1990) and Bouillon et al. (2006). However, an important character of *Tubularia* defined by these authors is the presence of eight or more longitudinal canals in the hydrocaulus. In the present material the hydrocaulus is an open canal filled with parenchyme and lacks internal ridges or partitions thus setting it apart from the accepted concept of the Tubulariidae. A new genus, *Lobataria*, is therefore proposed.

Type material is lodged in Museum Victoria (NMVF).

### ***Lobataria* gen. nov.**

**Diagnosis.** Hydroid solitary, hydrorhiza a tubular stolon, hydrocaulus long, widening in diameter from base to distal end, inner lumen filled with parenchyme, without endodermal canals or longitudinal ridges, perisarc thin around neck, secreted from a groove between hydranth base and neck; hydranth vasiform with one whorl of filiform aboral tentacles continuing over hydranth base, and two whorls of filiform oral tentacles. Blastostyle unbranched, gonophores sessile cryptomedusoid with distal process and large lobate apical flanges; actinula larva released from gonophore.

**Etymology.** The genus is named for the conspicuous apical lobes of the gonophore.

***Lobataria newtoni* sp. nov.**

**Material examined.** Holotype: NMVF 157465, 1 fertile stem, alcohol preserved, Blairgowrie jetty, Port Phillip, Victoria, Australia, coll: J. E. Watson, 4 Nov 2007, depth 2 m; attached to old bivalve shell buried in sand. Paratype: NMVF 157466, 12 fertile stems, alcohol preserved, Blairgowrie jetty, Port Phillip, Victoria, Australia, coll: J. E. Watson, 4 Nov 2007, depth 2 m. Paratype, NMVF 157467, two fertile stems, alcohol preserved, Rye, Port Phillip, Victoria, Australia, coll: D. A. Staples, 23 Apr 2008, depth 2 m.

**Description from holotype and paratype (live material).** Hydroid solitary, hydrorhiza a simple undulating tubular stolon with thick perisarc, extending for a short distance from base of hydrocaulus over bivalve shell.

Hydrocaulus long and slender, narrow proximally, circular in section, increasing in diameter from base to hydranth, perisarc firm, closely and deeply corrugated proximally, corrugations continuing at irregular intervals for some distance above base, perisarc extending upwards into a filmy inflated collar below hydranth; hydrocaulus filled with parenchyme, no endodermal canals, ridges or partitions.

Hydranth moderately large, vasiform, aboral tentacles long, filiform, hollow, arranged in a single whorl of 28–34, base of tentacles oval; nematocysts abundant on proximal part of tentacles, becoming scattered distally along tentacle; about 24 short filiform oral tentacles arranged in a tight tuft of two rows.

Blastostyles arising just above aboral tentacles, moderately long, trailing between the tentacles, bearing 30–50 gonophores in clusters in various stages of development. Immature gonophore globular, tending to pyriform at maturity; just prior to maturity a long finger-like process protrudes from a central

apical orifice; at maturity apex surrounded by four radially arranged tall transparent lobate flanges which extend halfway down gonophores, edge of flange armed with a conspicuous row of large stenoteles (stenotele [i]).

Mature gonophore containing a single actinula pushing spadix to one side. Actinula at release with ten capitate aboral tentacles, directed alternately up and down and six filiform oral tentacles, aboral pole large, dome-shaped.

Measurements (mm) from holotype and paratypes

Hydrorhiza, width	0.2 – 0.4
Hydrocaulus	
Length	10 – 40
width at base	0.3 - 0.4
Hydranth	
diameter of basal collar	0.7 – 0.8
maximum length of aboral tentacles	9
maximum length of oral tentacles	2
width of aboral tentacle at base	0.4 – 0.5
Blastostyle, length	3 – 8
gonophore, length mature	0.5 – 1
peduncle of blastostyle, proximal width	0.3 - 0.5
Actinula	
overall length at release	0.9

Six kinds of nematocysts in three morphological categories present: stenoteles of four sizes and shapes, a desmoneme and a microbasic mastigophore each of one size.

Description, measurements ( $\mu\text{m}$ ) and distribution of nematocysts

Nematocyst	Dimensions	Aboral tentacles	Oral tentacles	Gonophore and flange
Stenotele (i) capsule diameter shaft	10 – 14 10	A	R	A
Stenotele (ii) capsule (oval) shaft	11–15 x 8–10 9–10	N	C	A
Stenotele (iii) capsule (oval) shaft	8–10 x 6–7 8	A	A	A
Stenotele (iv) capsule (oval) shaft	8–10 x 6 8	A	A	Absent
Desmoneme capsule (bean-shaped)	6–7 x 5–6	A	A	Absent
Microbasic mastigophore capsule (elongate oval)	9–11 x 3–5	C	R	R

Key to abundance: A = abundant, C = common, N = not common, R = rare.

**Colour.** Hydrocaulus pale brown, hydranth flesh-pink, tentacles transparent white; developing female gonophores orange, changing to strawberry red at maturity; male gonophores paler, actinula white, spadix brown.

**Etymology.** The species is named for Andrew Newton, diving colleague and underwater photographer.

**Remarks.** *Lobataria newtoni* occurs on old bivalve shells buried at one to two centimetres in the sandy seabed on open sandy to silty seabed in shallow water with mild current flow. It is anchored to shells by a hydrorhiza comprising a short, sticky stolon coated with sand grains. The stolon often passes underneath the shell fragment to more securely anchor the hydrocaulus to the substrate. Most hydrocauli are solitary and widely scattered across the seabed although small patches of up to 10 hydranths rarely occur (fig. 1). This habit is similar to *Tubularia acadiae* (Petersen, 1990), which also attaches to old shell but the hydrocaulus of that species is canaliculate. Observations indicate *L. newtoni* occurs and is reproductive from summer to winter when water temperatures in Port Phillip range from 10°C (July) to 20°C (February).

Formation of the blastostyle commences early in the life of the hydranth. The developing gonophore contains many small eggs, but at maturity only one becomes an actinula. The large apical flanges surmounting the gonophore while rather variable in shape are typically lobate to ear-shaped. The peripheral band of large stenoteles bordering the flange is visible in living material even at low magnification. At release, most actinulae immediately settle on adjacent shell fragments and within a few hours develop a short hydrocaulus; exceptionally, juveniles sometimes attach to an adult stem, giving an appearance of a falsely branched hydrocaulus.

The lifespan of individual hydrocauli could not be ascertained as, despite searching one month after the first summer collection, all hydranths had disappeared from the original locality, only a few bare stems remaining. Recolonisation soon occurs, with new hydrocauli re-establishing in the same general microhabitat. Hydrocauli may have a very short life span or are rapidly lost due to fish or invertebrate grazing. An undescribed nudibranch of the genus *Cumanotus* (R. Burn, pers. comm.) was found feeding on unprotected tissue above the perisarc collar at the base of some hydranths.

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Figure 1. Group of *Lobataria newtoni*, Blairgowrie, Port Phillip, Victoria, depth 2 m, July 2008.

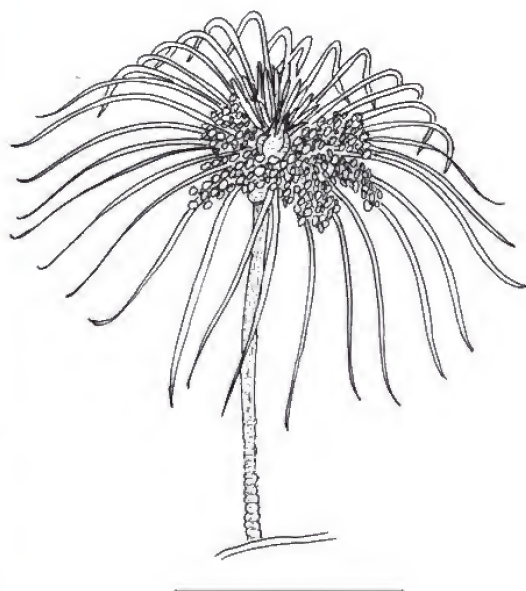


Figure 2. Fertile hydranth. Scale bar: 10 mm.

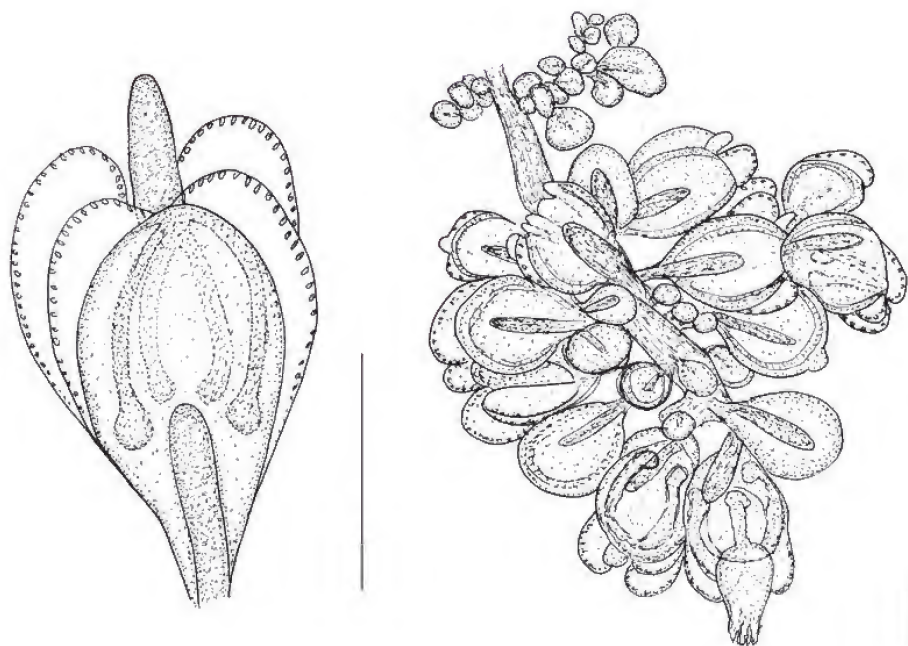


Figure 3. 3A: Blastostyle with gonophores in various stages of development. 3B: mature gonophore with lobate apical flanges, nematocysts and central protrusion. Scale bar: A, 1 mm; B, 0.5 mm.



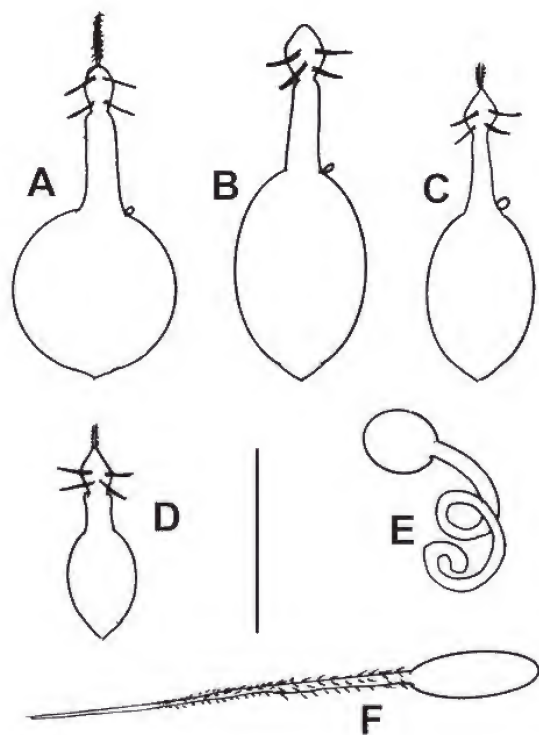


Figure 4. Nematocysts. 4A: stenotele (i) from gonophore flange. 4B: stenotele (ii) from oral tentacles. 4C: stenotele (iii) from aboral tentacles. 4D: stenotele (iv) from tentacles. 4E: desmonene from tentacles. 4F: microbasic mastigophore from aboral tentacles. Scale bar: 10  $\mu$ m.

